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Building Information Modelling in Ireland 2017

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Building Information Modelling in Ireland 2017

**Building Information
Modelling in Ireland
2017**

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About the Authors

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Barry McAuley is a Chartered Construction Project Manager and the Postdoctoral Researcher for the BIM Innovation Capability Programme in Ireland. Barry has completed both an MSc and a BSc Honours Degree in Construction Project Management, as well as a BEng in Civil Engineering. In May of 2016 he completed a PhD in Building Information Modelling (BIM) and Facilities Management. These diverse qualifications have enabled him to carry out a number of different roles within the AEC/FM industry. Barry has had a significant body of work published through a combination of industry reports, conference proceedings and journal papers.

Dr. Alan Hore

Dr. Alan Hore is a Chartered Quantity Surveyor and currently the Head of Quantity Surveying in the School of Surveying and Construction Management in Dublin Institute of Technology. Alan was one of the founders of the Construction IT Alliance and completed a PhD in Construction IT in Trinity College Dublin in 2007. He has an extensive portfolio of published work in the discipline area of Construction Informatics and is currently the Principal Investigator on the BIM Innovation Capability Programme of Ireland.

Professor Roger West

Roger is an Associate Professor in the Department of Civil, Structural and Environmental Engineering at Trinity College Dublin. Roger sits on the Irish Concrete Consultative Committee (National Standards Authority of Ireland) and is Chairman to the Irish Concrete Society Durability Committee. Roger is a Chartered Engineer and a Fellow of Trinity College Dublin. He is a former Head of Department and is currently Director of the Structural Laboratories. His main research interests are concrete technology, construction innovation and structural mechanics. Roger is currently the Advisory Research Supervisor on the BIM Innovation Capability Programme.



Pictured from left to right:
Dr. Barry McAuley
Dr. Alan Hore
Professor Roger West



Executive Summary



BIM or Building Information Modelling is a process for creating and managing information on a construction project across the project lifecycle. One of the key outputs of this process is the Building Information Model, the digital description of every aspect of the built asset.

www.nbs.com

Executive Summary

BIM is perhaps the most topical issue in construction throughout the world at present, as it is associated with solving so many of the present concerns in our industry.

Our lack of housing, shortage of skilled workers, poor document management, overrunning project budgets and sustainability challenges are just a few of the challenges that BIM promises to assist in solving.

The increasing importance of “digitisation” to modern construction and engineering businesses is becoming more apparent as more and more clients are explicitly asking for BIM in the design and delivery of new facilities and infrastructure.

This report provides a snapshot of BIM in Ireland in 2017. The report demonstrates the interest that BIM has gained in Ireland in recent years and the remarkable progress that Ireland has made in building BIM capability in recent years.

The emergence of a BIM programme in the UK provided a focus for our industry in recent years. This report will demonstrate that Ireland’s BIM journey is well underway and in many respects we are as mature as any country in the developed world when it comes to BIM proficiency and diffusion.

Our industry, public sector contracting authorities, educators and in particular Enterprise Ireland have responded in a very positive way.

A multitude of initiatives are presented in this report, which include the important work of the CitA BIM Innovation Capability Programme (BICP) in Ireland, the National BIM Council and the recent publication of the Government’s position paper on a public sector BIM adoption strategy.

The particular responses by many of our tier 1 contractors, specialist M&E contractors, representative institutions and our higher education institutes has provided a solid platform of capability that will ensure that our industry and graduates of the future will be prepared for a more formal standardised requirement for BIM from both public and private clients both at home and overseas.

Dr. Alan V Hore,
Dublin Institute of Technology
and CitA

“ Properly implemented, a public sector Building Information Modelling (BIM) adoption strategy will support the implementation of Government policy objectives in the procurement of public works projects, in their construction and in their maintenance upon completion.”

GCCC Position Paper
A Public Sector BIM Adoption Strategy
15th March 2017



Context and Challenges

Irish Construction: A Sector in Recovery
Challenges Facing the Irish AEC Sector
Government Response
Importance of BIM for Irish Construction



Irish Construction: A Sector in Recovery

The Irish Construction Industry has been in recovery since 2011 with a steady increase in construction output (Figure 1). The fall in output from the 2008 height of €38 billion remains a long way off the European sustainable level of between 10-12% of GNP¹. Whilst the 2007 peak in construction output was unsustainable, the predicted output for 2018 only represents between 7-8% of GNP in Ireland.

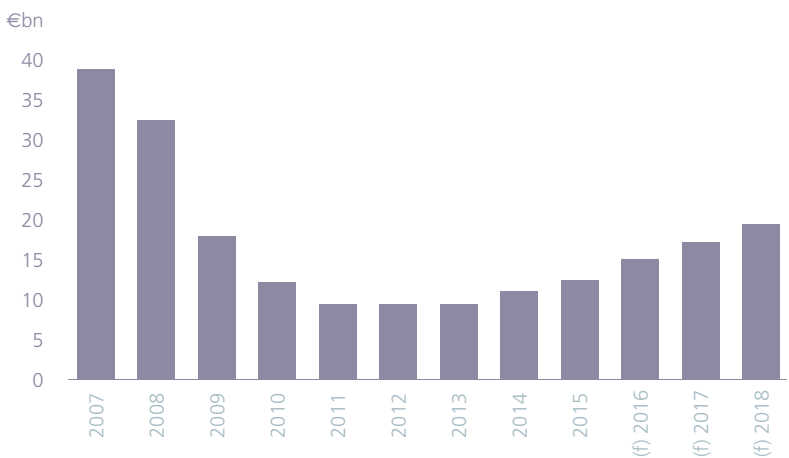
A recent DKM and CIF report highlighted the UK's decision to leave the European Union as the most prevalent risk to growth in the Irish economy². DKM also warned that the IMF prediction that growth will converge to its estimated potential (about 3% per annum) over the medium term is the most realistic outcome for the sector, noting that crisis legacies in the form of elevated public and private sector debt will leave the economy susceptible to shocks.

Despite this cautionary economic outlook the Irish construction industry is on an upward trajectory and the future is bright, creating an opportunity for the innovative use of digital technologies and more collaborative ways of working. This is echoed in the *Construction Information Services (CIS) Construction Opportunities 2017 Special Report* which highlights in excess of €17 billion in key and major projects is already scheduled for 2017 in the Construction Sector³.

“The recent Multi-Annual Public Capital Investment Allocations for 2017-2019 reported a planned expenditure of €4.5 billion in 2017 and €5.3 billion in 2018 and over €6 billion in 2019. The major areas of Government expenditure will be in transport, education, enterprise, housing and health, which together account for over 70 percent of the planned outlay. These numbers do not include non-exchequer investment by semi-state bodies including ESB, Irish Water and Ervia, which will add significantly to the total of public sector capital expenditure.”

Derry Scully,
Group President, Linesight

Figure 1:
Value of construction output 2007 - 2018



Ireland Regional Analysis 2017, Knowledge Centre, Linesight, pp. 5.
(Source DKM, Department of the Environment, CIF)

¹ Linesight (2017) Ireland Regional Analysis, Knowledge Centre, Linesight.
² DKM Economics Consultants and Construction Industry Federation (2016) Demand for Skills in Construction to 2020, DKM and CIF
³ Construction Information Services (2016) CIS Construction Opportunities 2017 Special Report, CIS

Challenges facing the Irish AEC Sector

“ Ensuring adequate finance is available to the sector is critical and our survey confirms this remains a key challenge. Available funding for the sector, whether this is for housing or infrastructure projects, is key to ensuring our economy can continue on its growth path.”

Niall Cogan,
Senior Manager, PwC

“ There is an emerging trend in the number of construction businesses reporting difficulties in recruiting skilled staff. Over a third of companies in the sector (37 per cent) are reporting difficulties recruiting skilled labour, with 33 per cent citing a lack of appropriate skills.”

InterTrade Ireland,
Business Monitor Report 2017

“ BIM is the solution to allow this level of customisation in housing, allowing individualism while ensuring a high degree of quality, performance and cost. If the main driver is designing and constructing quickly on a very limited budget, take a look at Richard Rogers' £15-20k houses which can be assembled in three-four hours.”

Peter Baxter,
Vice president for engineering, natural resources and infrastructure sales for Autodesk, Building.co.uk, 02.05.17

The freefall collapse of the Irish construction industry and wider economy between 2007-2012 brought with it a number of consequences that are now creating a significant number of challenges. According to the 2016 Pricewaterhouse Coopers (PWC) Construction Industry Survey, optimism is high in the Irish construction industry, but securing finance for projects is the top challenge (54%) facing the industry, followed by competitive project pricing (44%) and the scarcity of qualified staff (32%)⁴. The survey revealed that hiring people with managerial skills and planning and feasibility expertise is much more difficult from year to year.

The Irish Construction Prospects to 2016 report also cites the quantity of new graduates and ageing workforce as key barriers. The report also demonstrates further concerns in reaching current housing targets, as it estimated that there is a requirement for approximately 25,000 units to be built annually with the latest figures showing that 11,016 units were completed in 2016⁵. InterTrade Ireland Business Monitor Report also details concerns with regards to the emerging skills shortage in the construction sector with over a third of companies in the sector reporting difficulties in recruiting⁶.

As Brexit adds further uncertainty it has never been as important to embrace these technologies and innovative practices. Brexit has the potential to be hugely damaging to the construction industry with the potential of Ireland being affected by instability through its largest trading partner. Carefully monitoring and lobbying for Brexit concerns by representative groups will be a strategic focus for the sector going forward.

⁴ Pricewaterhouse Coopers (2016) 2016 PwC Construction Industry Survey, Price Water Cooper Ltd

⁵ DKM Economics Consultants and Society of Chartered Surveyors Ireland (2016), Irish Construction Prospects to 2016, DKM and SCSi

⁶ InterTradeIreland (2016) InterTradeIreland Business Monitor Report: September/December 2016, InterTradeIreland

Government Response

Given the backdrop to the recovery of the sector and the increasingly important contribution that Irish construction is making to the Irish economy, the government in recent years has focused much of its attention on the AEC sector, and in particular, the importance of the use of digital tools and processes, such as those offered by BIM.

This process began with the 2013 *Forfás Ireland's Construction Sector: Outlook and Strategic Plan to 2015* which aimed to accelerate the industry's return to a sustainable growth path and ensure the sector was in a position to operate competitively in domestic and international markets⁷. Specific mention was made of BIM in the report as an advanced technology that will ensure increased competitiveness and innovation in the sector.

The report outlined specific actions for sustainable growth, with an action for Enterprise Ireland, Industry Representative Bodies, Higher Education Institutes (HEI) and Skillnets to work together to promote the use of BIM and develop the appropriate technical skills amongst Irish construction firms, so that they can successfully compete in markets where BIM is widely adopted or required.

In a report on the Review of the Performance of the PWC published in December 2014, by the OGP, it was found that risk was not being priced in many tenders for a variety of reasons and where risk arose it was leading to claims⁸. The report included a medium-term strategy in respect to BIM. This strategy included a recognition by the Government Construction Contracts Committee (GCCC) that BIM was a powerful risk management tool that offers opportunities to move the construction of buildings from the building site to off-site fabrication. It was also acknowledged that BIM had the potential to provide more efficient and safer ways of working that generates less waste and to offer potential savings on the operational costs of buildings.

This was followed in 2014 by the Construction 2020 Strategy, which aimed at restoring a properly functioning, sustainable and dynamic construction sector, operating at an appropriate level for the size of the economy⁹. The report outlined two specific actions which included implementing a BIM staged development programme to support companies advancing to level 2 BIM capability, which subsequently led to the development of the BIM Enable and BIM Implement support programmes for Enterprise Ireland clients.

⁷ Forfas Report (2013) Ireland's Construction Sector: Outlook and Strategic Plan to 2015, Forfas.

⁸ Government Contracts Committee for Construction (2014) Report on the Review of the Performance of the Public Works Contract, Office of Government Procurement.

⁹ Irish Government (2014) Construction 2020: A Strategy for a Renewed Construction Sector, The Stationery Office.

“ Technological advances in materials, construction methods, ICT (including Building Information Modelling or BIM), and global communications are transforming all aspects of the sector from the development of new products and services to more efficient ways of working.”

Forfás, 2013.

“ BIM has the capacity to reduce the risk exposure of the contracting authority, design team and contractor because of the level of information that is required to generate the model and the level of information it provides to the building management team. Consideration must be given to making its use mandatory for projects of a certain scale and complexity.”

Review of the Performance
of the PWC.

“ There is a need to ensure appropriate skills and expertise are available to facilitate a competitive construction sector now and into the future. There is also a need to increase the attractiveness of the sector, ensuring it appeals to young talent.”

Construction 2020 Strategy, 2014.

Government Response (continued)

In January 2016 the Government launched Ireland's *National Skills Strategy 2025* which identified technology as a key driver for change in the economy¹⁰. The report specifically identified sector specific skill needs, which included, chartered surveyors; internationalisation and management capability; ICT, BIM systems and Green Economy skills.

In the EGFSN September 2016 *National Skills Bulletin* BIM was also identified as a skills shortage amongst construction professionals¹¹.

In January 2017 the Government launched its *Action Plan for Jobs 2017* acknowledging particular challenges the country faced in ensuring an adequate supply of housing¹².

The Government also published *Rebuilding Ireland – Action Plan for Housing and Homelessness*, in July 2016, which set out an array of actions to stimulate housing delivery in Ireland, which included expanding and accelerating a rapid-build housing programme to deliver up to 1,500 social housing units by Q4 2018, focusing primarily on finding more suitable accommodation for families that are currently residing in commercial hotels¹³.

A particular action flowing from the Action Plan for Jobs 2017 included a requirement for the Office of Government and Enterprise Ireland to prepare a strategy for the adoption of BIM across the public capital programme and to mandate the manner in which it is to be adopted across the public sector.

Following consultation with public bodies engaged in public works projects, the GCCC has prepared a position paper for the purposes of inviting responses from industry. The position paper titled *A Public Sector BIM Adoption Strategy* outlines the context and rationale for the adoption of BIM on Irish public works projects and puts forward a proposed timeline for adoption ranging from 12 - 48 months for projects to adopt BIM¹⁴. These projects range from Band 1, which are of low complexity, such as low density housing projects, to Band 5 which are complex projects with a specialist operation and maintenance regime, such as acute hospitals. At the time of publishing this report the GCCC were seeking feedback on the proposal.

Further details of this proposal are included elsewhere in this report.

¹⁰Department of Education and Skills (2016) Ireland's National Skills Strategy 2025, Department of Education and Skills.

¹¹Skills and Labour Market Research Unit (2016) National Skills Bulletin 2016:©, Expert Group Future Skills Needs.

¹²Department of Jobs, Enterprise and Innovation (2017) Action Plan for Jobs 2017, Irish Government.

¹³Department of Housing, Planning, Community and Local Government (2017) Rebuilding Ireland – Action Plan for Housing and Homelessness, Irish Government.

¹⁴Office Government Procurement (2017) A Public Sector BIM Adoption Strategy: A GCCC positional paper, Government Construction Contracts Committee.

Importance of BIM for Irish Construction

Slowly returning to prosperity, the Irish construction industry is experiencing tight profit margins, skills shortage, possible trade impediments through Brexit and the current housing crisis. There should be no doubt about the increasing relevance of BIM to Ireland. The recent Global BIM study published by CITA showed that over 50% of the 27 countries reviewed had a regulatory requirement or were planning to implement one in the near future^{15 & 16}.

The recent *Farmer Report* on the UK construction labour model warned that the industry must modernise or die¹⁷. The report warns that the UK construction labour model is facing challenges that have not been seen before which has created an absolute imperative for change. The report recommends a wholesale and coordinated 'special measures' approach to drive transformational change with any recommendations aligned to stakeholder intent, sufficient funding and scale. The Irish construction industry is not too dissimilar to the UK in turning to BIM as a solution to help drive this transformational change.

According to Construction 2020, industry could address the skills shortage through BIM by increasing the attractiveness of the sector to younger professionals. Our closest neighbour the UK Government has made the use of BIM mandatory for any new central capital funded public sector projects since 2016. Many Irish AEC businesses turned towards the UK for work during the recession. As such they now have a foothold in the UK market and access to readily available BIM frameworks and guidelines necessary for working on Level 2 BIM projects.

Ireland can learn from other jurisdictions, such as the French Government where BIM is expected to add significantly to the programme to deliver 500,000 homes by the end of 2017.

Work is currently underway by the EU BIM Task Group that will provide more consistent guidance for member States by developing a policy on the deployment of BIM across the EU.

Ireland is playing its part in the formulation of this guidance, with the important work of the National BIM Council in preparing a *Roadmap to Digital Transition for Ireland's Construction Sector* due to be published in Q3 2017.

“Digitization signifies a substantial economic and social revolution. It changes the conditions for growth, prosperity and the work of tomorrow – and revolutionizes, in a disruptive process, industries and services, value chains and manufacturing process, innovation and product life cycles.”

Alexander Dobrindt,
German Road Map for Digital Design
and Construction.

“The implications for Irish construction are clear; unless construction contractors and service providers are able to work in a BIM environment they are likely to find themselves at a serious competitive disadvantage, particularly in overseas markets.”

Forfas Report,
Ireland's Construction Sector: Outlook and
Strategic Plan to 2015.

“As a group we believe that the public sector can show leadership across the union and ultimately help Europe develop a world-class digital construction sector – one that is open, digital and competitive.”

Adam Matthews,
EU BIM Task Group.

¹⁵ McAuley, B., Hore, A. and West, R.(2017), BICP BIM Global Study, Lesson for Ireland's BIM programme, CITA Ltd.

¹⁶ Federal Ministry of Transport and Digital Infrastructure (2015) Road Map for Digital Design and Construction, German Government.

¹⁷ Farmer, M. (2016) The Farmer Review of the UK Construction Labour Model: Modernise or Die, Construction Leadership Council.

Learning from others

Global BIM
Europe
United Kingdom
Scotland



Global BIM

The recent World Economic Forum report *Shaping the Future of Construction* (WEF, 2016) reported that most other industries have undergone tremendous changes over the last few decades, and have reaped the benefits of process and product innovations¹⁸. The WEF reported that the construction sector has been hesitant about fully embracing the latest technological opportunities.

The WEF report outlined how labour productivity in construction has largely stagnated with only the fishing industry investing less in innovative Research and Development (R&D). The forum acknowledges that this is beginning to change thanks to digitalization, innovative technologies and new construction techniques such as BIM, Augmented Reality (AR), use of drones, 3D scanning and 3D printing, all now reaching market maturity.

Given the topical nature of the transformative potential of BIM, coverage of global adoption has been varied and diverse. The 2017 Irish publication *Global BIM Study: Lessons for Ireland's BIM Programme* (www.bicp.ie/bicp-global-bim-study/) sought to add a panoptic perspective to global adoption.

This global BIM study reports on regulation, the presence of champions and noteworthy publication in 27 countries (see Figure 2 and 3). The report highlights the increasing relevance of BIM in the international construction community.

Over 50% of those countries reviewed had a regulatory requirement for BIM or are planning to introduce one in the near future. The presence of key champions and drivers of BIM in each country was clearly evident with a significant number of countries being influenced by the work of buildingSMART chapters within their regions. Over 60% of the countries reviewed have produced a BIM Guide or Manual to assist in the promotion of BIM locally.

Figure 2:
BICP Global BIM Study:
Lessons for Ireland's BIM Programme



¹⁸ World Economic Forum (2016), *Shaping the Future of Construction - A Breakthrough in Mindset and Technology*, World Economic Forum.

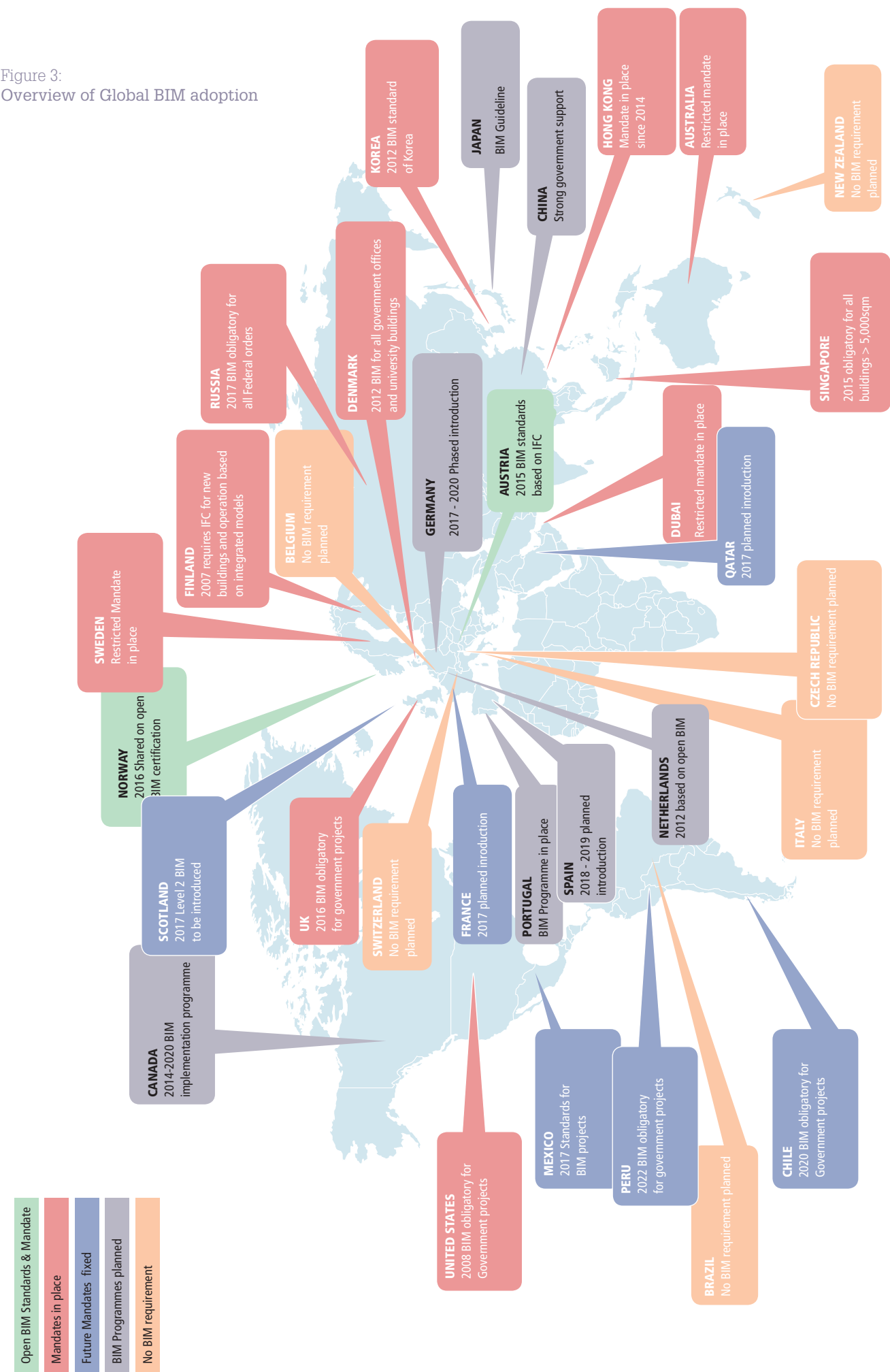
“The future of construction requires the commitment and encouragement of many active participants in our industry – people who believe in a modern E&C industry that will benefit all.”

John M. Beck, (WEF, 16).

“The use of BIM is widespread on large projects across northern Europe - Scandinavia, the Netherlands, Germany and Finland were early adopters. The UK government mandated the use of BIM to Level 2 on all central government projects by 2016. Its use in the US is widespread and Singapore is seen as an innovator in this area requiring planning applications to be submitted in BIM format – the city of New York has also set this requirement in recent times.”

GCCC Position Paper,
A Public Sector BIM Adoption Strategy
15th March 2017

Figure 3:
Overview of Global BIM adoption



Europe

Europe is now host to the greatest regional concentration of government-led BIM programmes in the world (See Table 1).

Finland and Norway were the first to set standards, followed by procurement policies from the European Commission, the UK, Netherlands and most recently government and industry initiatives from France, Germany and Spain.

In 2015, the European Commission assigned the EU BIM Task Group the role of delivering a common European network approach to align the use of BIM by public procurers, policy makers and public estate owners. Table 1 provides a brief overview of BIM in a selection of European countries:

Table 1: BIM in Selected Countries

Denmark	In June 2011, the Danish Parliament extended the mandatory adoption of BIM to all local and regional projects worth over €2.7 million, while central government projects had a lower threshold of €677,000.
Finland	Senate Properties has mandated since 2007 for all design software packages to pass Industry Foundation Class (IFC) Certification in accordance with the requirement in its BIM guidelines.
France	The French government's view is that the greatest value of BIM is within the housing sector, where BIM will be deployed to deliver over 500,00 homes by the end of 2017.
Germany	A number of high profile jobs have run significantly over budget which has led to establishment of the Planenbauen 4.0 limited company which will guide and steer the implementation of BIM towards a 2020 mandate.
Netherlands	In order to improve quality, continuity and international competitiveness of the Dutch building industry in 2012, the Netherlands set up the Building Information Council (BIR) as part of Rijkswaterstaat highways and waterways BIM programme. To further stimulate the BIM initiative a national direction and coordination platform for the development of open BIM standards was set up (BIM Loket).
Norway	The government established its national mandate in 2016 to reduce errors, improve coordination, increase energy efficiency of its buildings and in general gain efficiencies within the construction industry
Spain	The Spanish government are introducing a BIM mandate for March 2018 and further mandatory use in infrastructure projects by 2019
Sweden	Despite BIM not being mandatory in Sweden, five public companies are collaborating to establish demands and standards regarding BIM.

“ At a European level the 2014 Procurement Directive recognises the role of BIM in project delivery and the EU Commission has established the EU BIM Task Group to deliver a common European network aimed at aligning the use of BIM in public works. A Handbook for the Introduction of BIM by Europe's Public Sector Community is to be published in Q3 of 2017.”

GCCC Position Paper,
A Public Sector BIM Adoption Strategy
15th March 2017.

United Kingdom

“ Sustained leadership from central government is crucial to maintain industry commitment to invest in BIM capability.”

Government Construction Strategy, 2016-2020.

“ There is a lot of smoke and mirrors in the marketplace. From the software side we are seeing an uptake, but we still see it siloed in the different disciplines. Government shouldn’t take its foot off and say we’re there. We still have to work very hard at proving the benefits.”

Jason Ruddle,
Chief Operating Officer, Elecosoft.

“ The industry as a whole has not moved on enough. Clients still do not understand what they are asking for or what BIM is. The majority don’t have any idea and basically see BIM as a cost. This is a massive issue for us, especially when we are trying to embed this as a business – how do we explain to our Directors that this is what we need to be doing?”

Jill Guthrie,
Willmott Dixon Construction.

The UK Government has made the use of BIM mandatory for any new central capital funded public sectors projects since April 2016. The UK has issued, in tandem with their Level 2 BIM initiative, a suite of connected frameworks and guidelines that are influencing guidelines in many other countries. This includes a number of Pubicaly Available Specifications (PAS) and British Standards (BS) which offer best practice in information management for the capital, delivery and operational phases of construction projects using BIM. The UK government has more recently embarked on an ambitious Level 3 BIM programme. Following a successful BIM programme the UK is now recognised as a global leader in the adoption of BIM with wide-scale uptake in recent years.

The use of BIM on UK Government funded projects has been reported as delivering savings in the region of £3 billion. According to the Royal Institution of Chartered Surveyors, while the construction industry is often criticised for delivering projects “late and over budget”, BIM offers “predictability”, “effectiveness” and “efficiency”. The government has been quick to acknowledge the environmental and economic benefits of BIM. Since 2016, all construction firms bidding for central Government contracts have been required to have Level 2 BIM status. With focus now shifting to Level 3 BIM, there has never been a more exciting time for the digital construction sector^{19 & 20}.

It has been over a year since the UK Government’s Level 2 BIM mandate came into force. This mandate intended to bring the entire industry into the digital age. A recent Construction Manager Forum and survey asked BIM proponents and BIM experts their opinions on the impact of the BIM mandate. Some of the tier one businesses reported that they were routinely working with Level 2 BIM and were now thinking about Level 3. It is evident that there is a growing awareness of BIM in the UK market. It is inevitable that with a bold initiative, such as the Level 2 BIM mandate, it will take time to get the industry on board. It was reported that the adoption of BIM by centrally funded clients seems patchy.

The most recent NBS 2017 survey shows that take-up is growing but raises concerns that private clients do not understand BIM and that the government is failing to enforce its own mandate²¹.

¹⁹ Cabinet Office Infrastructure and Projects Authority (2016) Government Construction Strategy: 2016-2020, UK Government.

²⁰ Ravenscroft, T. (2017) Round Table Asks: What Happened to the BIM Bang?, BIMplus.co.uk

²¹ NBS National BIM Report 2017.

Scotland

Scotland due to its proximity, similar scale to Ireland and progress with BIM was selected as an ideal country to explore in some detail in this report. The Scottish government carried out a major review of construction procurement in recent years. A key recommendation therein was the introduction of a BIM Level 2 BIM public sector adoption policy by April 2017. BIM in Scotland is seen as a digital technology to improve the efficiency and delivery of project outcomes for publically funded construction projects.

The Scottish Futures Trust (SFT) is an independent company, established by the Scottish Government, with a responsibility for delivering value for money across public sector infrastructure investment programmes. SFT was charged with managing the Scottish BIM programme and appointed David Philp to Chair the Scottish BIM Delivery Group. Philp brings a wealth of experience following his previous role as Head of BIM Implementation at the UK Cabinet Office and existing role as Head of BIM at the UK BIM Task Group ²².

The Scottish BIM Implementation Plan was launched in 2015 and has recently been successful in achieving its 2017 milestone for Level 2 BIM delivery. On 9 March 2017, the BIM Delivery Group launched the new BIM Guidance Portal for Scotland’s Public Sector. This portal provides clear guidance in the implementation of BIM within public sector procurement and supports the Public Sectors drive for greater value from its built assets through a collaborative and digitised way of working. This impressive website contains valuable information on BIM Level 1 and 2 standards, useful templates, BIM library, BIM viewing tools, relevant research and three key tools that were specifically built by the SFT BIM team. These tools are described in Table 2.

Table 2: Soft BIM tools

BIM Grading Tool	The BIM grading tool provides a method to assess when a public sector project should adopt BIM and to what level.
ROI Calculator	The Return on Investment (ROI) BIM tool estimates the benefits and the level of return that the adoption of BIM Level 2 will bring to a project.
BIM Compass	The BIM Compass is a simple, unambiguous and confidential way to assess your current BIM capability and compare against Industry benchmarks.

²² Scottish Futures Trust, (2015), Building Information Modelling (BIM) Implementation Plan, September 2015.

²³ Scottish Procurement (2017) Scottish Procurement Policy Note 1 2017, Scottish Government.

“ The future of construction requires the commitment and encouragement of many active participants in our industry – people who believe in a modern E&C industry that will benefit all.”

John M. Beck, (WEF, 16).

“ The use of BIM is widespread on large projects across northern Europe - Scandinavia, the Netherlands, Germany and Finland were early adopters. The UK government mandated the use of BIM to Level 2 on all central government projects by 2016. Its use in the US is widespread and Singapore is seen as an innovator in this area requiring planning applications to be submitted in BIM format – the city of New York has also set this requirement in recent times.”

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BIM in Ireland

Enterprise Ireland
National BIM Council
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Construction IT Alliance
CitA BIM Regions
BIMIreland.ie
Interest Groups
Industry Consultation
Government Adoption
GCCC Public BIM Adoption Strategy
Use of BIM Standards
Higher Education
Case Studies



Enterprise Ireland

Enterprise Ireland has been the central driving force for innovation in Irish construction since it was set up in 1998. As a government organisation they work in partnership with Irish enterprises to help them start, grow, innovate and win export sales in global markets.

The inclusion of specific responsibilities for Enterprise Ireland to implement a BIM staged development programme was embedded in the Construction 2020 report to support companies advancing to Level 2 BIM and to work with industry organisations to promote the use of BIM and develop the appropriate technical skills amongst Irish construction firms.

In January 2017, Enterprise Ireland launched a new strategy, 'Build Scale, Expand Reach' which covers the four year period from 2017-2020²⁴. The objective of the new strategy is to transform the innovation and competitive capabilities of Irish enterprise, especially through a strong commitment to lean programmes, in order to consolidate existing market share and expand the global reach of ambitious Irish companies into diversified export markets.

In response to Construction 2020, Enterprise Ireland launched two particular funding initiatives.

The *BIM Enable* programme is a 7 day strategic consultancy programme designed to heighten BIM knowledge across business functions and ultimately deliver a bespoke roadmap to Level 2 BIM proficiency based upon a company's vision and resources. *BIM Enable* is intended for clients lacking capability in BIM methodologies. The maximum grant funding available from Enterprise Ireland is €6,300.

The *BIM Implement* programme represents the training phase of the BIM induction offer supporting knowledge transfer leading to increased competencies in BIM and a deeper understanding of supply chain implications. The aim is to embed BIM skills and knowledge across an organisation and equip the appropriate staff members with the competencies to successfully manage a BIM project. Assignments may vary in size and scope but will typically be of 6 months duration but may not exceed a total project cost of €70,000.

Enterprise Ireland are also funding the *BIM Innovation Capability Programme* (BICP) in Ireland and are the key driving force in setting up the *National BIM Council* (NBC) in Ireland. Presently the council is focusing on the preparation of a roadmap entitled *Roadmap to Digital Transition for Ireland's Construction Sector* which will complement the recent proposal by the Office of Government Procurement (OGP) for a Public Sector BIM Strategy.

²⁴ Enterprise Ireland (2017), Enterprise Ireland Strategy 2017-2020: Build Scale, Expand and Reach, Enterprise Ireland.

“Digitization of the sector is an inevitable next step, and achieving an industry standard of BIM Level 2 would allow us to continue to compete on the world stage.

There is a lot of consultation going on and that is brilliant, because the only way this is going to work is through consultation, partnership and inclusiveness. Listening to the concerns of all parts of the community will result in BIM being delivered in a way that everyone is happy with. There is a lot of global evidence of how it's worked in different markets, so we can learn from those and take the best of this and embrace it for our own solution here in Ireland.”

Stephen Hughes,
Head of Construction,
Enterprise Ireland

National BIM Council of Ireland

In 2014, Enterprise Ireland hosted the first National BIM Forum to address the key enablers and barriers to a wider adoption of BIM in Ireland. The forum recommended the establishment of a National BIM Council (NBC), a body that would co-create a roadmap to increase industry adoption within Ireland.

The formation of the council is also a key measure in fulfilling Enterprise Ireland's obligations under the Construction 2020 strategy. The council is set to work with industry organisations to promote the use of BIM and develop the appropriate technical skills amongst Irish construction firms so that they can successfully compete in markets where BIM is widely adopted or a requirement.

The core objective of the council is to recognise the role that technology and 'better information management' plays in achieving measured improvements in productivity, international competitiveness, collaboration and innovation in the construction industry.

An aspiration of this committee was not just to capture what has been done elsewhere but to leverage these learnings to become recognised 'collaborators and innovators' in the sector.

The starting point for the National BIM Council was the review of digital strategies developed by other countries. The BIM Innovation Capability Programme (BICP) established in 2016 collated important research to support the work of the council, looking at other global strategies, researching Ireland's current capability in both industry and education and providing evidence-based performance indicators from project case studies in Ireland.

The council is currently working on a roadmap entitled "Roadmap to Digital Transition for Ireland's Construction Sector" due to be published in Q3 2017. The roadmap is a summary of consultation, discussion and review through a collaborative process to better understand how Ireland's construction sector can progress to a digital future that will ensure significantly improved project outcomes.

The NBC's key vision for their 2017 Roadmap is to create a framework to support the long-term structure and governance of the Irish construction industries digital transition. In the interim, the NBC transition model will press ahead with identifying and putting into play the initial prioritised recommendations.

“The starting point for the Council has been the review of digital strategies developed by other countries and this has led to the formation of eight key constructs for the NBC roadmap. The leadership of Government and industry, public and private sector support, standards, procurement, skills and training have been prioritised as key components.”

Caroline Spillane,
Chair, National BIM.

“As we move towards the end of this year a challenge has been set for the new National BIM Council to develop a high level strategic roadmap that will guide Ireland's Construction Industry and enable it to transition towards a digital economy that is not only fit for purpose but also setting the standard internationally.”

Sean Downey,
Director of Specialist Contracting
Construction Industry Federation.

BIM Innovation Capability Programme

In consideration of views expressed at the National BIM Forum in 2014, and following a competitive tendering process, Enterprise Ireland commissioned CITA under the new BIM Innovation Capability Programme (BICP) to undertake detailed research that seeks to accelerate the Irish construction sector's adoption of digital processes and tools.

The BICP seeks to capture the capability of the Irish Construction Industry and the Higher Education Institutes to respond to the increased requirement for BIM on Irish construction and engineering projects. The outputs of the BICP will seek to influence the strategic use of BIM by key clients and procurement policy makers in Ireland. There are four distinct work packages to achieve the strategic objectives of the BICP (Figure 4). Further information on each work package can be found on www.bicp.ie.

Work Package 1: This package focuses on a desk-based study appraising Global BIM Adoption, BIM in Ireland, BIM technology trends, Irish BIM case studies and general focus on any noteworthy publications on national BIM initiatives and BIM capability. For further details on this work package and information on current progress visit www.bicp.ie/work-package-1-overview.

Work Package 2: This package focuses on a field-based study, appraising a mapping of all BIM training and educational programmes on offer in Ireland, interviews with key stakeholders both public and private. For further details on this work package and information on current progress visit www.bicp.ie/workpackage-2-overview.

Work Package 3: This package will involve a thorough analysis of all the data collated in Work Packages 1 and 2. This will involve a detailed discussion of the implicit meaning of the aforementioned data.

Work Package 4: This package involves identifying and organising appropriate mechanisms and mediums for distributing the data collated to targeted audiences. A list of key communications can be found at www.bicp.ie/bicp-communication.

Figure 4: BICP Work Packages



Yes, we have strengthened the training, IT resources, and workflow/ protocols which we already had in place, to streamline Level 2 equivalent output, which we had begun to work towards, before the mandate. It has additionally opened up insight into whether we would export our services abroad (though this enthusiasm was damaged by the outcome of Brexit).

Table 3 – BIM Barriers 2015

BIM Barriers	%
Cost	66%
No client demand	57%
Lack of in-house expertise	56%
Lack of training	55%
No time to get up to speed	45%

Table 4 – BIM Barriers 2016

BIM Barriers	Rank
Clients unaware of the value proposition	5.38
Implement BIM within smaller companies	3.54
Lack of standardised tools and protocols	3.52
A lack of BIM skills within current staff	3.24
Issues regarding data ownership and liability	3.15
Uncertain legal environment for BIM to work	3.08

National BIM Surveys

Enterprise Ireland announced the official results of the first Irish BIM National Survey at the formal launch of Digital Construction Week (DCW) event in London in mid-October 2015 which was hosted by Enterprise Ireland in the Irish Embassy.

The authors sought to report on the extent to which the digital transition of Ireland's construction sector is underway. A sample size of the 100 most influential leaders in architecture, engineering and contracting Ireland were selected with the co-operation of the Association of Consulting Engineers of Ireland (ACEI), Construction Industry Federation (CIF), Society of Chartered Surveyors in Ireland (SCSI), Engineers Ireland and the Royal Institute of Architects in Ireland (RIAI). The questionnaire was modelled on the UK NBS BIM Survey to allow for comparative analysis at a later date but was shortened to facilitate ease of completion. A significant response rate of 68% was achieved.

The survey revealed that 67% of the industry respondents possessed confidence in their skills and knowledge to deliver BIM, while only 6% reported no confidence. The remaining 27% reported a general knowledge of BIM and a gradual improvement in BIM skills.

The top five barriers that were reported are shown in Tables 3 and 4 representing 2015 and 2016 respectively.

It can be seen that the traditional barriers to BIM of cost and lack of demand ranked the most highly, closely followed by internal organisational pressures, such as a lack of expertise, insufficient training and time management (Tables 3 and 5). Notwithstanding the fact that respondents reported a lack of client demand as a barrier, almost 75% of the sample reported an increase in demand for BIM in Ireland, which is significant. Respondents were largely split on the matter of a BIM mandate in Ireland.

The 2016 results which achieved a similar response rate to 2015 reported an increase in confidence in BIM skills and knowledge (76%). 79% of the sample also reported an increase in demand for BIM in Ireland, which was significant.

The majority of respondents reported that they were significantly influenced by the UK BIM mandate, confirming that a significant proportion of their BIM projects were in the UK and not Ireland.

The barriers reported in 2016 differed to those reported in 2015, with client's unawareness of the benefits of BIM as the main barrier identified. The lack of capability among SMEs and the lack of a standardised framework in Ireland were also seen as significant impediments. The shortage of BIM skills was also a major concern for the sample.

A total of 66% of the sample believed that Ireland should follow the UK footsteps and mandate BIM. This is in comparison to the 50/50 breakdown in 2015. A more detailed account of the results of both the 2015 and 2016 survey can be located <http://www.bicp.ie/digital-transition-survey>

Construction IT Alliance

The Construction IT Alliance has been promoting digitization in Irish construction for over 15 years. The cornerstone of CitA activities were founded on organizing networking events focused around construction IT issues.

CitA was founded as a not-for-profit organization in 2005 and soon added education and training activities to its offering. CitA has been very successful in securing funding from both Enterprise Ireland and Skillnets for their networking, training and education programmes.

There has been a particular focus on BIM by CitA in recent years which has been influenced, in particular, by the UK Government BIM programme on the lead up to the 2016 UK mandate.

Since 2012 CitA has facilitated a programme of BIM events and in 2013 organised the inaugural CitA BIM Gathering international conference. The third CitA BIM Gathering conference is scheduled to take place in Croke Park Stadium on the 23rd and 24th November 2017.

In the past two years CitA has worked closely with the constituent members of the Construction Industry Council in the delivery of the CitA Smarter Building Cooperative Series which sees each of the industry associations chairing and contributing to the design and content of the programme. The 2017 programme is proving very popular with industry and is gaining a lot of attention nationally in Ireland.

Since 2008 CitA has secured funding from Skillnets in the design and delivery of industry-led training, much of which has focused on BIM. The CitA MSc in Construction Informatics is accredited by the Dublin Institute of Technology (DIT) and is delivered online by a number of international and national BIM experts from both academia and industry. In more recent years additional BIM centric modules have been added to the programme.

CitA secured funding from Enterprise Ireland for the two year BICP initiative which commenced in early 2016.

Coinciding with this funding CitA was invited by Enterprise Ireland to act as secretariat of the NBC of Ireland placing CitA at the centre of shaping national BIM policy.

CitA continues to represent the interest of its members and is appropriately placed to contribute positively to a national BIM programme for Ireland.



CitA BIM Regions

In 2015 CitA were invited to become honorary members of the UK BIM Regions Network.

CitA quickly established three BIM regions, which have now expanded to nine throughout the country (Figure 5).

The purpose of the regions is to raise awareness of BIM, promote a shared understanding of the value proposition, share experiences of working with BIM on local projects and address the challenges of implementing BIM.

The regions are seeking to develop a consistent message and provide valuable feedback to the CitA BIM Group, which currently has in excess of 7,600 members on LinkedIn.

Table 5 provides the current contact co-ordinating each region (please note that this is likely to change). For more updated information please visit www.cita.ie

Table 5 – Ireland's BIM Region Groups

Region	Chair	eMail
CitA BIM Group (National)	Ralph Montague	ralph@arcdox.com
CitA Eastern Region	Johanna Wallwork Cillian Kelly	johanna.wallwork@turntown.com C.Kelly@SISK.ie
CitA Western BIM Region	Mark Costello Michelle Fahey	Mark.costello@rpsgroup.com mfahey@jjrhogan.com
CitA South East BIM Region	Brian Dempsey a Ellen Nugent	b.dempsey@wit.ie e.nugent@wit.ie
CitA South West BIM Region	Paul Vesey Tim Segal	Paul.vesey@lit.ie Tim.segal@staff.ittralee.ie
CitA North West BIM Region	Trevor McSharry Anne Boner	Mcsharry.trevor@itsligo.ie Anne.boner@lyit.ie
CitA Midlands BIM Region	Mel McGerr Finola Deavy	mel.mcgerr@mmarchitecture.ie fdeavy@ait.ie
CitA Southern BIM Region	Ger O'Sullivan	Ger.osullivan@dpsgroupglobal.com
Northern Ireland BIM Region	Mark McKane	m.mckane@ulster.ac.uk

BIMIreland.ie

BIMIreland.ie has become an established source for information on Building Information Modelling and Digital Construction for the Irish BIM Community and BIM enthusiasts in recent years.

BIMIreland.ie is an Irish building magazine resource in collaboration with CitA. Over the past 2 years BIMIreland.ie has published BIM news and views from the construction industry as it has embraced digitisation.

BIMIreland.ie is ranked in the top 100 of the SustMeme 'BIM Top 500' influencers and players active on Twitter, has over 1,500 Twitter followers and is active on Google +, LinkedIn and Facebook. Over 57% of BIMIreland.ie LinkedIn followers come from Owner, Director and Senior Management roles. 73% are Male and 27% are Female.

BIMIreland.ie has covered BIM news, technology, companies, projects, BIM jobs and BIM People. BIM adoption has been one of the principle topics in the Irish Construction Industry over the past 2 years. It has covered the progress of Irish companies' BIM adoption and the Irish Construction industry's move to digitisation.

BIM People is a popular feature on the website where interviews are run with BIM professionals from Ireland and around the World. The biggest names in the international BIM community have featured, including Paul Doherty, Chairman of theBIMcompany and President and CEO of the digit group, inc; Bill East, Owner of Prairie Sky Consulting; Fred Mills, Co-Founder and Director of The B1M, Ronan Collins, Executive Director at AECOM, Malaysia; and David Philp, Global BIM/MIC Consultancy Director at AECOM and Chair of the Scottish BIM Delivery Group. Over 40 interviews have been featured, many with Irish BIM experts working in a variety of roles in industry and academia.

Irish construction companies are now selling their services and products around the world and their BIM and Digital Construction skills are helping them enter new markets and win work - this is reflected in the BIM People interviews.

CitA's activities have featured prominently over the past 2 years, and readers can find reports from the events and details of programmes on BIMIreland.ie, including the 2015 CitA BIM Gathering, the CitA Smarter Cooperative Building Series' 2016 and 2017, the BIM Innovation Capability Programme (BICP), and the CitA Regional events. Not only has BIMIreland.ie covered BIM, it has covered associated topics: Virtual Reality, Augmented Reality, drones, and Lean Construction.

“BIMIreland.ie is a fantastic resource for BIM and Digital Construction, especially its focus on people and how they are leveraging new integrated and technology enabled processes. The stories are international and help readers advance their own digital journey.”

David Philp,
Global BIM/MIC Consultancy Director at AECOM and Chair of the Scottish BIM Delivery Group.

“BIMIreland.ie has become the 'go-to' resource for all things related to BIM, Digital Construction, and Lean Construction in Ireland. If you want to know what leading companies are doing in the industry, BIMIreland.ie is definitely your first 'port-of-call.'”

Ralph Montague,
Managing Partner at Arcdox.

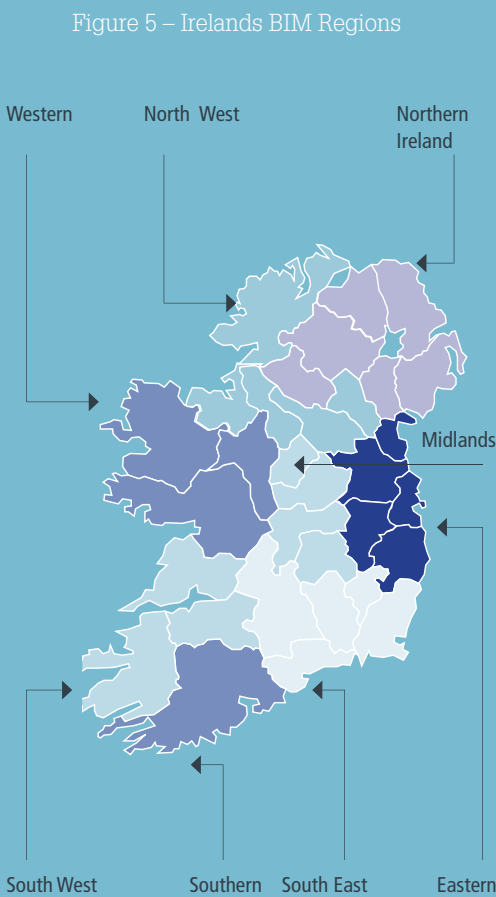
“BIMIreland.ie is an excellent resource for keeping up to date with what is happening in the world of BIM. I find that the articles and interviewees across such broad areas and disciplines that there's always something new to learn from them.”

Louise Kelly,
Architectural Technologist and BIM Project Manager at Fulcro.

BIM Regions Focus:
CitA Eastern BIM Region

“There are multiple challenges to BIM adoption and they vary country to country, region to region, discipline to discipline, organisation to organisation etc. and it is for this specific reason that we would like the Eastern BIM Region group to be a place where people can come to for correct information and relevant links to assist them in their BIM journey.”

Cillian Kelly,
John Sisk & Son
BIMIreland.ie
May 2017



Interest Groups

In recent years a number of interest groups have formed throughout Ireland to focus on BIM matters. The groups mainly form part of special interest groupings or committees within representative organisations and professional institutions. A brief summary of each of these groups and their contact point is shown in Table 6. These groupings have collectively assisted in developing BIM maturity in Ireland in 2017.

Table 6 – BIM Interest Groups in Ireland

Group	Outline Description and Contact Point
BICP BIM Client Working Group	<p>The BICP Client Working Group was established to capture and investigate current client awareness, adoption and future plans for use of Information Communication Technology (ICT), as well as particular concerns in response to the growing awareness of ICT related practices.</p> <p>Chair: Dr Claire Penny, IBM</p>
BIM Academic Forum Ireland (BAFI)	<p>The group’s mission, similar to the UK BIM Academic Forum, is to create a dynamic group to develop and promote the training, learning and research aspects of BIM through strong collaboration and cooperation. The group will foster integrated collaborative working on projects over the asset lifecycle through academic involvement and enhancement of BIM.</p> <p>Chair: Dr Alan Hore, DIT</p>
CitA BIM Group	<p>The CitA BIM Group, is a working group of members of the CITA network, with a particular interest in BIM. The group comprises consultants, end-users and software vendors and has official representation from a number of industry stakeholder groups (RIAI, CIAT, ACEI, IEI, CIES, iStructe, CIBSE, iSCS, CIF, CIOB, Law Society, OPW etc). The express purpose of the group is to investigate the benefits of BIM and to generate ideas for the general advancement of BIM for the Irish Construction Industry, through information sharing, collaboration and training, and to report findings back to the CitA Network.</p> <p>Chair: Ralph Montague, ARCDUX</p>
Construction Industry Federation (CIF)	<p>The Lean Construction, BIM, Innovation and Continuous Improvement Committee was set up in 2016 as a sub-committee of the CIF Executive Body. The Committee was established for a number of reasons; these include the following:</p> <ul style="list-style-type: none"> • To consider all policy developments / matters in the area of Lean Construction, BIM, Innovation and Continuous Improvement. To advise the Executive Body on CIF policy in this area. • To develop the Federation’s strategy with regard to its evolving relationship with client organisations in both the public and private sector covering Lean Construction, BIM, Innovation and Continuous Improvement. • To examine best practice domestically, at EU level and internationally to ascertain the best approach for the Federation in developing policy for Ireland. <p>Chair: Sean Downey, CIF</p>
Countruction Industry Council (CIC)	<p>The CIC’s vision for the industry brings together 6 Irish major industry bodies to lead and accelerate Ireland’s transition to digital for the sector. These include the RIAI, ACEI, Engineers Ireland, CIF, SCSi and the Building Materials Federation (BMF). The CIC embraces BIM and actively encourages the Irish Construction and Built Environment Sector to continue to take full advantage of current and emerging information and communication technologies to remain at the forefront of the industry in Europe.</p> <p>Chair: David O Connell, McAuley Daye O’Connell</p>

Table 6 continued

Group	Outline Description and Contact Point
Engineers Ireland	<p>The Engineers Ireland BIM working group has published extensively within the Engineers Journal on BIM. The Engineers Ireland contracts working group is also investigating how best to implement BIM into the Irish contractual landscape.</p> <p>Contact: Declan Alcock, Varming Consulting Engineers</p>
Revit Users Ireland Group (RUIG)	<p>The RUIG which is a multidisciplinary “Community of Innovators”, meets once every quarter, sharing information, ideas, tips and tricks, to promote the more efficient use of Revit and related BIM tools across the disciplines, exploring ways to improve collaboration. The goal is to establish Revit users in Ireland as world leaders in the implementation of BIM.</p> <p>Chair: Ralph Montague, ARCDUX</p>
Royal Institutes of Architects Ireland (RIAI)	<p>The RIAI BIM committee aims to recognise the role that technology and ‘better information management’ plays in achieving measured improvements in productivity, international competitiveness, collaboration and innovation in the construction industry. The RIAI have produced templates for an Irish focused BIM Execution Plan (BEP) and Employer’s Information requirements (EIR).</p> <p>Chair: Ralph Montague, Arcdox</p>
Society of Chartered Surveyors Ireland (SCSI)	<p>The SCSi has established a BIM Working Group. It recently published a report on Chartered Quantity Surveyors Perspective on Building Information Modelling (May, 2017). The survey results show that 100% of Quantity Surveyors are now aware of BIM. This is an increase on those surveyed in 2013 and is reflective of the increased interested within the Irish Construction Industry. 63% of respondents have a ‘Good level of BIM Knowledge’ or are currently using it in their work. The working group is planning to create guidance material to assist on how model information will need to be customised to ensure the data can be used by the QS.</p> <p>Chair: Gary Comerford, Linesight</p>
The Association of Consulting Engineers Ireland (ACEI)	<p>The ACEI has recently formalised its BIM Committee which is now working on a number of tasks including the CIC’s BIM Vision, the Irish BIM Survey and have been liaising with CitA and other professional bodies on BIM implementation and adoption in Ireland.</p> <p>Contact: Brian Lahiff, Garland Consultancy</p>

Industry Consultation

“ We are trying to convince people all the time, there’s value here, whether it’s time or waste. But I think that we have to try start measuring metrics.”

Mark Danaher,
Kirby Engineering.

“ The client doesn’t know what Level 2 BIM means and even if they did, they have no capability of actually taking the information in a 3D model because their computer and software, as well as their technical people, are not capable of processing it.”

Gary Comerford,
Linesight.

“ I think it’s important to look at what’s happening around the world and we definitely don’t need to reinvent the wheel in Ireland.”

Simon Fraser,
Fraser Hussey Solicitors.

“ Colleges need to focus on how to get students ready for when they go into working in an industry BIM-enabled environment.”

Mark Danaher,
Kirby Engineering.

The BICP team have had ongoing engagement with industry practitioners. In an effort to advance this engagement, a BICP Consultation Workshop took place in November 2016 with representative organisations attending²⁵. This included a diverse representation from architecture, engineering, surveying, contracting, legal, education and the client sector. Items under discussion included establishing strategies to increase the value proposition of BIM to clients, establishing current legal impediments, identification of pathfinder projects, BIM standards and BIM education.

The discussion included how to persuade more private clients to engage with BIM. It was broadly agreed that one needs to be able to show the client the value of BIM by demonstrating specific savings. These potential savings must be tracked through the life of the project with the relevant metrics put in place to quantify these benefits. There was a general opinion that clients require guidance in learning what to expect from BIM. However, it was acknowledged that many clients were very knowledgeable.

There was broad agreement that Ireland would benefit from a BIM certification regime, ideally implemented by the National Standards Authority of Ireland.

The complexity of adapting and amending contracts to work with BIM was also discussed at length in addition to the vexing issue of model ownership.

Pathfinder projects were seen as an important learning vehicles for the industry. It was suggested that it would be beneficial for these projects to use the best of technology and therefore encourage technology companies to be involved.

Many would be of the opinion that the example provided by the BIM authorities in the UK should be utilized to ease the burden of developing BIM guidelines in Ireland. Most of the workshop attendees had experience working within the UK PAS framework. Many were also aware of the work ongoing in the development of the ISO 19650 due to their impeding ISO accreditation.

There was broad agreement that the Irish HEIs have responded very well to the demand for BIM skills in industry. There was a general call for the professional accrediting bodies to ask on a consistent basis for BIM in AEC programmes in Ireland and for both industry and technology companies to assist HEIs in programme design, resourcing and delivery.

²⁵ <http://www.bicp.ie/industry-consultation-workshops/>

A second BICP consultation workshop is scheduled to take place in Galway in Q2 2017.

In more recent months the BICP team, through the *Engaging with the BIM Community Survey*, engaged with persons who have a responsibility for BIM in Irish architecture, engineering, construction, facility management businesses. A total of 90 BIM professionals were identified with 47 responses received²⁶.

The sample identified an impressive number of BIM projects that their companies were working on in Ireland. These included the application of BIM on social housing, hotels, primary care, education, commercial, pharmaceutical and food manufacturing facilities. Only 25% of the sample reported that they had secured grant funding for BIM. Funding was primarily sourced through Enterprise Ireland’s BIM Enable and BIM Implement initiatives. Other sources include Enterprise Ireland Innovation Vouchers. A number of respondents stated they were unaware of available funding or found some of the criteria required for funding difficult to achieve.

Less than 20% of the respondents reported that they had sought BIM certification. The most popular choices of accreditation include BSI Level 2 Practice accreditation, BRE and Lloyds. A number of respondents indicated that they are in the process of obtaining company accreditation. Some respondents had sought individual professional accreditation through the BRE Academy Level 2 Fundamentals and Project Information Manager courses.

The community of BIM practitioners reported they were comfortable working with the requirements of BS 1192 and the PAS 1192 suite of standards. The AEC UK BIM protocol was also used as a source of guidance by many of the respondent companies. In some instances companies have developed in-house BIM and Modelling Standards.

These results are in line with the findings of the 2016 Irish Digital Transition Survey which showed an increase in adoption of PAS1192: 2 and PAS1192:3 from 33% and 35% in 2015 to 55% and 45% in 2016 respectively.

The majority of respondents agreed that if BIM is to become widespread then adequate resources need to be provided for training and upskilling, which should primarily be focused at SMEs. There was a renewed call not to reinvent the wheel and learn from the UK. The respondents offered a number of suggestions for the National BIM Council of Ireland (see overleaf):

²⁶ <http://www.bicp.ie/bim-managers-ireland/>

Industry Consultation continued

Respondents suggestions

- Leverage the work that the UK has done in implementing BIM, however, Level 1 BIM should be the first goal.
- Clients need to become more educated about the importance of establishing clear and concise asset information requirements at the outset of projects where BIM is mandated. It would be beneficial to showcase projects where successful delivery of asset data into live FM systems has been completed and is in fact in use.
- The sooner an Irish BIM mandate happens, the better, however, the Irish supply chain is not yet capable of working in a Level 2 BIM Environment.
- Full engagement with all professionals/stakeholders in AECO Industry and the development of a Construction Contract that would enable the deployment of BIM Level 2 on projects in Ireland.
- Further promotion in 3rd level education.
- Define the specific BIM protocols and standards which will be adopted in Ireland and provide practical support.
- Comprehensive guidance on BIM implementation available for all stakeholders from clients to designers to contractors.
- A clear strategy for BIM accreditation or certification which is independent of commercial vendors who currently provide this certification.
- Don't push for an all out Irish Government mandate to use BIM for Public Sector Projects, a mandate only overcomplicates things.
- Provide a network of upskilling venues for the industry dedicated for different disciplines. Support training and education (particularly for senior management).
- Provide grants for upgrade of hardware and software.
- Consider logistics for SME BIM implementation.

Government Adoption

Despite the absence of an Irish Government BIM mandate there have been a number of positive publications which have in part supported BIM adoption in Ireland in recent years. The most recent was an action proposed within the government's *Action Plan for Jobs 2017* which called for the Office of Government Procurement (OGP) to prepare a strategy for the adoption of BIM across the public capital programme and to mandate the manner in which it is to be adopted across the public sector. The OGP will manage the consultation process that will conclude with the submission of an outline strategy for Government approval. Once completed, a draft strategy will be published for comment from industry bodies including the NBC.^{27,28}

Despite a lack of apparent endorsement of a BIM mandate to-date from the government, a number of contracting authorities have been specifying BIM for a number of years on publically funded works projects. *The National Development Financial Agency (NDFA)* continues to promote the use of BIM technologies and adopt best practice methodologies that drive improved value for money in the delivery and operation of public infrastructure. Some of these projects within the public sector include the €135 million courts bundles and schools bundles, all to be delivered by BAM who will use BIM technologies and processes throughout. *The Grangegorman Development Agency (GDA)* has requested the BIM process as part of its tender which will form part of the East/Central Quads. *The Health Service Executive* has also requested BIM as part of its tender requirements for the new Children's Hospital (NCH) due to the complex nature of the project.

The *Office of Public Works (OPW)* has representatives that are actively involved in the EU BIM Task Group. The awareness in the *Department of Education and Skills (DoES)* is strong and movement has been made to understand the BIM process. Transport Infrastructure Ireland (TII) is exploring the possibility of using BIM for the Metro North. *Irish Water* has also signaled its intention to use BIM processes on the Ringsend project. *The Dublin Airport Authority* is using BIM processes to carry out a number of refurbishment projects. Awareness is growing within the County Councils with interest registered from *Dublin City Architects*, *Fingal County Council*, *South Dublin County Council*, and *Dun Laoghaire and Rathdown County Council*. At present DCC is investigating a number of avenues with regards to pilot projects and is working with external design team members who are operating within a 3D environment. To assist with knowledge sharing with regards to BIM, the Public BIM Working Group has been set up to provide guidance to public sector representatives who are interested in BIM.

²⁷ Fraser, S. (2014). How BIM can be adopted within public works contracts, *Engineers Journal*.

²⁸ Irish Building Magazine (2017) BIM at the Office of Government Procurement, *Irish Building Magazine*, Iss 1, 2017

“BIM also offers significant potential for savings on the operational costs of buildings. A more collaborative and fairer approach can be achieved through the re-drafting of the Public Works Contracts (PWCs) to include the use of BIM technologies or, preferably as the PWCs have failed to deliver on the intended objectives, through abandoning these contracts and replacing their use with more collaborative and integrated standard form contracts which are widely available and used internationally.”

Simon Fraser,
Construction Solicitor Hussey and Fraser

“BIM represents a really useful tool to deliver Government's construction procurement policy and fits well with the public works contracts because it provides an assurance, once the information requirements are met, that a project is well defined.”

“The DoES and the OPW have invested in the technology and are applying it to many of their projects internally. Transport Infrastructure Ireland is looking to adopt BIM on some of their projects. The local authorities are building their BIM capacity with Dublin City Council pushing it on their bigger projects. There is a broad interest across the public sector.”

David O'Brien,
Senior Advisor to the Construction
Procurement Policy Unit in the OGP.

GCCC Public BIM Adoption Strategy

(Statement of Intent)

BAND 1:
Complex projects with straightforward operation and maintenance requirements i.e. Small schools, low density housing projects and simple civil engineering projects.

BAND 2:
Medium complexity projects with straightforward operation and maintenance requirements i.e. School buildings, low rise apartment schemes, civil engineering projects involving simple structures.

BAND 3:
Medium complexity projects with particular operation and maintenance requirements i.e. Third level educational facilities, high density apartment schemes, primary care centres.

BAND 4:
Complex projects with particular operation and maintenance requirements i.e. Specialist third level facilities, hospitals, complex civil engineering structures e.g. large span bridges.

BAND 5:
Complex projects with a specialist operation and maintenance regime i.e. Acute hospitals, laboratories, specialist civil engineering structures.

Following consultation with public bodies engaged in public works projects, the GCCC prepared a position paper in mid-March 2017 for the purposes of inviting responses from industry. The position paper titled ‘A Public Sector BIM Adoption Strategy’ outlined the context and rationale for the adoption of BIM and put forward a proposed timeline for adoption. The adoption strategy steers away from project sizes and instead focused on two criteria; construction complexity and operation and maintenance regimes.

The strategy recognised 5 different project types as defined in Table 7 below which presented the very different project types procured across the public service. The timeline will allow those bodies who do not have experience of BIM to undertake their own pilots for projects in Bands 1, 2 and 3 in line with the standards set out in the strategy.

The Office of Government (OGP) is managing the consultation process that will conclude with this submission formally in Q3 2017. The consultation process started with the key capital spending public bodies represented on the GCCC. At the time of writing this report responses were under scrutiny by the OGP.

Table 7: Timeline for Public Sector BIM Adoption²⁹

Dept./Body	Sub Sector	Band 5	Band 4	Band 3	Band 2	Band 1
Ag. & Marine		–	–	–	+36	+18
Defence		–	+18	+24	+36	+48
Education	Primary	–	+18	+24	+36	+48
	Secondary	–	+18	+24	+36	+48
	Third Level	–	+18	+24	+36	+48
Health	HSE	+12	+18	+24	+36	+48
	Vol. Hospitals	+12	+18	+24	+36	+48
Housing	Housing	–	+18	+24	+36	+48
	Non-Housing	+12	+18	+24	+36	+48
OPW	Heritage	+24	+30	+36	+48	–
	Flood Risk Management	–	–	–	+36	+18
	New Build	+12	+18	+24	+36	+48
Transport	Rail	+12	+18	+24	+36	+18
	Road	+12	+18	+24	+36	+18

BIM Level 1
BIM Level 2

²⁹ GCCC (2017), A Public Sector BIM Adoption Strategy, Ref CCP 01/17, 15th March 2017, pp. 9.

Use in BIM Standards

There is currently a great deal of discussion and negotiation taking place globally in respect to international BIM standards.

The current development of ISO 19650 is very topical with the published standards ISO19650-1 and ISO19650-2 due to be released in late 2017. The Publicly Available Specifications (PAS) 1192-1, 2 and 3 are largely influencing the contents of the new international BIM standard. Due to the inability to reach broad agreement on all technical aspects of the ISO, it is likely that there will be a locally acceptable addendum that will accompany the local adoption of ISO 19650.

The implications of being a member state of the EU, is that if a standard is adopted at CEN (European Committee for Standardization), then a Member State cannot have their own conflicting standard. CEN have already set up a Technical Committee to look at standards for BIM, and it is likely that they will adopt the ISO standard. Once that happens, the NSAI (National Standards Authority of Ireland), will be required to adopt those standards.

In December 2013, the RIAI Council resolved to adopt PAS1192-2 as policy, and promoted the adoption of PAS1192-2 in their role on the CIC Liaison Committee, and as key industry stakeholder in any consultation with government bodies.

They concluded that, in order to effectively work with the standards documents, the scope of services and workstages in Ireland will need to be aligned with those described in the standards, otherwise there will have to be a very complex “mapping” process for each project, to try and align services and workstages.

In the UK, the CIC recognised this problem, where each institution has their own Plan of Work or workstages, and associated Scope of Services. The CIC defined new workstages to align with the British Standards, and the RIBA (Royal Institute of British Architects) had to update their workstages, and associated scope of services, to suit. There is an opportunity to leverage all the effort that the RIBA put in to align their workstages (see information on the new RIBA Plan of Work <http://www.ribaplanofwork.com/Toolbox.aspx>).

A concerted effort needs to be made to try to streamline the way the industry operates in Ireland, and connect and align the various activities of the various Institutes.

The CIC BIM group are currently looking to align the RIAI and GCCC workstages. This group will be fully aware of the above, and should seek to get the GCCC and other industry stakeholders to a point where there is one agreed naming of workstages aligned to PAS1192, and that the scope of services are equally aligned.

It is important that the NSAI BIM standards committee continue to monitor and provide input to the CEN442 standard groups and advise authorities as appropriate.

“The Irish construction sector has much to offer the global marketplace, but we need our representative bodies to help ensure that we are allowed to compete on an equal basis with the best practices internationally. International best practice is not properly represented in the current suite of RIAI or GCCC Agreements for Services, nor in the requested adjustment of those documents to align with the latest redraft of the GCCC. It will be up to the individual industry stakeholder bodies, to present a united message to government, as to how we approach standards, and BIM in Ireland.”

Ralph Montague,
Chair, NSAI, CEN442, Mirror Committee.

Higher Education

Ireland’s HEIs have responded rapidly to a demand by industry for BIM related education and training programmes despite the absence of a national BIM mandate. A sample of programmes titles, modes of delivery and levels reported by Irish HEIs are listed in Table 8 below. More details on these programmes can be located at <http://www.bicp.ie/higher-education-bim-programmes/>.

Table 8 - BIM Programmes in Ireland

HEI	Title of Programmes	Mode of Delivery
Athlone Institute of Technology (AIT)	Revit Building Information Modelling (BIM) Project Management and Collaboration Advanced Revit Building Information Modelling (BIM) Project Management and Collaboration Beginners	CPD Part-time
Cork Institute of Technology (CIT)	Higher Certificate in BIM	Part-time
Dublin Institute of Technology (DIT)	MSc in Applied BIM & Management MSc in Construction Informatics	Part-time Part-time (online)
Dundalk Institute of Technology	Certificate in Building Information Modelling	Part Time
Galway Mayo Institute of Technology (GMIT)	Higher Diploma in Engineering in Building Information Modelling	Part-time and Full-time
Institute of Technology Carlow	BIM Management module on the MSc in Management in the Built Environment	Full-time
Institute of Technology Sligo	BIM for Quantity Surveyors’ module on the 4th year of the BSc BIM and 3D surveying model on the BEng (Hons) in Civil Engineering and the BEng in Environmental Engineering	Full Time
Institute of Technology Tralee (ITT)	Certificate in Building Information Management	Part-time
Letterkenny Institute of Technology (LKIT)	Higher Certificate in Science in Construction Technology with BIM Bachelor of Science in Digital Construction	Full-time
Limerick Institute of Technology (LIT)	Construction Management and BIM module in year 2 on the BSc (Honours) Construction Management and BSc (Honours) Civil Engineering Management Degrees.	Part-time (Special Purpose Award)
Ulster University	Postgraduate BIM module as part of the MSc in Commercial Management	Ulster University
University College Cork (UCC)	MEngSc in Information Technology in Architecture, Engineering and Construction	Full-time
University College Dublin	BIM components within the Design & Materials on the MSc module for the BEng Honours in Mechanical Engineering	Full-time
Trinity College Dublin	BIM modules in Façade Engineering and third year on the Bachelor Programme in Civil Engineering	Full Time
Waterford Institute of Technology (WIT)	Higher Diploma in Science in BIM BSc Honours in Architectural and Building Information Modelling Technology	Full-time Part-time

The BICP team established the BIM Academic Forum Ireland (BAFI) in 2016. In January 2017 a BIM Academic Forum Ireland (BAFI) was formed with a mission to “create a dynamic group to develop and promote the training, learning and research aspects of BIM through strong collaboration and cooperation. The group consisted of 14 different HEIs. The group’s aim, similar to the UK, is to establish an open medium between Irish universities, institutes of technology and private colleges with the purpose of sharing BIM knowledge, experience and case studies.

The BICP team surveyed members of the BIM Academic Forum in Ireland (BAFI) in Q1 2017. The results of the 2017 BICP study *Assessing the Current Position and Associated Challenges of BIM Education in Irish HEIs* confirmed a healthy confidence among Irish HEIs that they were responding to the demand for BIM education in Ireland³⁰. The vast majority of the HEIs were acutely aware of the work of the UK BIM Academic Forum (BAF) and were broadly in favour of adopting the learning outcomes framework adopted by UK BAF in Ireland. The key challenges identified by the survey sample included how to incorporate BIM into an already concentrated programme; cost of purchasing software, upgrading hardware and changing the culture of academic staff. The majority of institutes agreed with the proposal for the NBC to recommend the formal adoption of the BIM Academic Forums’ intended learning outcomes.

All the consulted HEIs report a demand from the industry to produce BIM enabled graduates. Some common challenges included ensuring that students are working from the same version of the software, lack of qualified staff, poor hardware which is unable to process the required graphics, as well as a lack of understanding of the benefits of BIM from other departments.

A number of HEIs are active within the research domain and have actively published BIM related papers for a number of years. For example the Building Information Modelling Collective Research Group in WIT has utilised the Enterprise Ireland Innovation Voucher programme for a number of years to fund Industry-Academia Partnership projects.

The World Building Information Model Server in UCD can store all information relating to the world’s built environment from roads to buildings to rooms. Instead of using a single central model approach for information exchange, the server uses an interoperable multi-model union.

³⁰ BICP Research Team and BAFI (2017) *Assessing the Current Position and Associated Challenges of BIM Education in Irish HEIs*, CITA Ltd. Available on www.bicp.ie.

“ We have insight into and some responsibility for multiple programmes across disciplines and across levels; therefore many of the questions were difficult to answer. At DIT, we have really developed lonely BIM adoption (e.g. in Architectural Technology and Building Services Engineering) while some programmes are only beginning their BIM journeys, e.g. structural engineering. We are revisiting our College BIM Strategy with a view to enabling collaborative BIM between as many disciplines as possible with a roadmap of implementation over the next 3 to 5 years. At postgraduate level, we have delivered BIM Technologies to individual disciplines and collaborative BIM processes and management for the last 5 years”

Dr. Avril Behan,
School of Multi-Disciplinary technology, DIT.

“ One thing that has been evident in the past few years is how BIM has brought people together to create a more productive and efficient construction sector in Ireland. We have a responsibility as educators in this sector to show leadership and provide our graduates with the skillset to work in a more collaborative and non-adversarial industry. The work of BAFI will be progressive respecting the academic freedom of individual education institutions but encouraging a greater consistency in the digital output skills that future graduates attain but also to share learning materials and encourage collaborative research.”

Dr. Alan Hore,
School of Surveying and Construction Management, DIT

Case Studies

Additional data collated by the BICP research team include a number of Irish BIM case studies which are currently detailed on the BICP website (see <http://www.bicp.ie/irish-bim-case-studies/>).



The New Children's Hospital (NCH) is the largest, most complex and significant investment project ever undertaken in healthcare in Ireland. A BIM model offered the opportunity to visualise space easily, therefore improving an awareness of underutilised areas, as well as being used by the whole team to further collaboration techniques, as it offered an easier way of interpreting the project requirements.



The Schools Bundle 4 (SB4) case study details how BAM applied BIM technologies throughout the design, construction and operational stage. BIM offered the contractor a more rewarding methodology with regards to the management of data during the operational phase. The project represents the first full commercial transition of a progressively developed building information model data-set making it the first Level 2 BIM project to transfer such data into a bi-directional CAFM system.



The Greenway Hub was the first new DIT building to be completed at Grangegorman. The application of BIM offered a number of efficiencies throughout the construction stage but more importantly it offered an opportunity for the Client to significantly improve their BIM policy moving forward. The contractor also developed a BCAR compliant workflow through BIM 360 Field, meaning the capture of all signoffs and certifications was dramatically simplified.



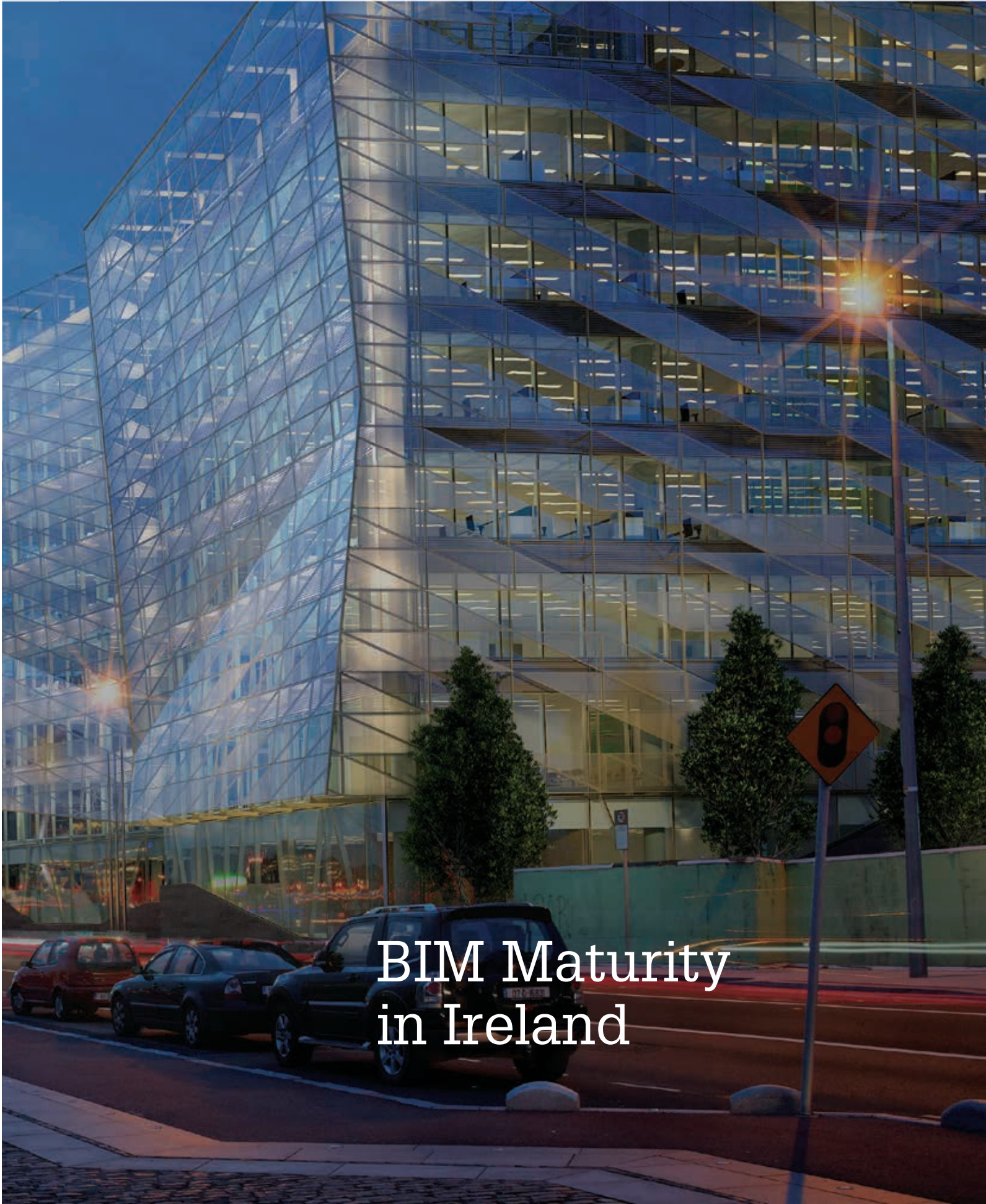
The Client's Brief for **1 Windmill Lane (1WML)** sought to capitalise on the shortage of premium office space and to do so required an optimum turnaround within the design process. As the client had a long-term hold strategy of the asset, WKN Nowlan recommended the use of BIM as a tool in developing options for redevelopment, as well as maximising value in the operational stage. The 1WML project has helped demystify BIM and has enabled the client to see first-hand the benefits associated with this process.

A number of case studies were presented at the CITA BIM Innovation Awards in 2016, which are also detailed on the BICP website. These case studies include the Designer Group who used BIM processes for the M&E Design for the full refurbishment and extension of the office building located at **27 – 33 Baggot Street Upper**. Garland worked within a collaborative BIM environment for the **MISA at St. James' Hospital** which was one of the first BIM projects delivered to a recognized standard in Ireland, as its central delivery process. The decision to adopt BIM for collaborative purposes on this project was reached at an early stage owing to the significant coordination that would be required within the multi-disciplinary design team. On the **Central Bank of Ireland** in North Wall Quay the client set an aspirational requirement for the project to be delivered in BIM. Henry J Lyons Architects once appointed developed a BIM execution plan and agreed the level of BIM integration on the project.

Other case studies involved Kirby Group Engineering who used BIM processes to deliver the **Telecity Data Centre**. Kirby took the lead role as model coordinator on the project, implementing a central federated model to allow the client and all trades to collaborate effectively throughout the project timeline. The **Sythwood School Project** involved McAvoys using models for digital information exchange between the client, designer, contractor, management organisation and other stakeholders in the project as far as practicable and feasible. On the **Mylan Dublin Respiratory Project, Phase 2** Mercury Engineering used BIM in order to improve coordination amongst the sub-contractors.

Ostick and Williams applied the cutting edge of BIM technology to build the **Wolfson Centre for Experimental Medicine**. BIM was used as a tool successfully for the design development, fabrication, installation and operation of the facility. For the **M8/M73/M74 Motorway Improvements** RPS adopted BIM as the core approach for the entire project. The project team to date have produced a fully coordinated and federated BIM model of the alignment, structures, drainage, utilities, temporary works, signage, road markings and lighting. Sisk delivered the **Multinational Data Centre Campus** through BIM processes and had the complete project team working together through the use of a Common Data Environment and BIM platform in a Collaborative Environment on site (BIM Hub). Stewart used BIM on the **Goethe Institute**, as they saw the potential returns from the correct implementation of BIM and all the benefits that could be achieved for the whole team.

Ongoing engagement with BIM personnel has led to the identification of additional case studies that the BICP will continue to showcase throughout 2017.



BIM Maturity in Ireland

Ireland's BIM Macro Adoption Study

This section details research recently undertaken by the BICP research team in association with Dr. Bilal Succar (AU) and Dr. Mohamad Kassem (UK). Dr. Succar and Dr. Kassem have developed five conceptual models that have been utilised to measure macro BIM adoption across the world. These models can be used for:

- Assessing a country's current BIM adoption policy.
- Comparing the BIM maturity of different countries.
- Developing a national BIM adoption policy.

In April total of 22 persons were targeted in Ireland to complete the *Macro BIM Adoption Study*, which formed part of a BIME Initiative (see <http://bimexcellence.org/>).

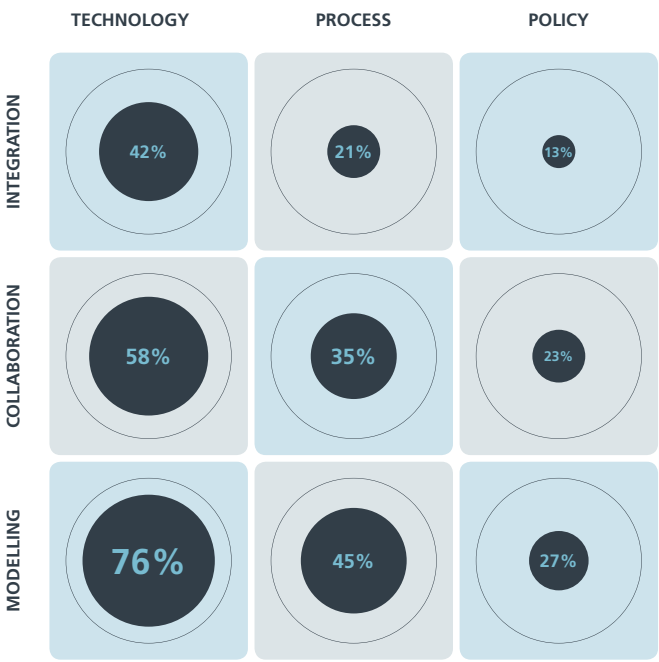
The maturity studied in this research focused on markets and not projects, teams, organisations or individuals. Specifically the study looked at the levels of "adoption and diffusion" of BIM in Ireland.

Model A: BIM Diffusion Areas

This model seeks to establish the extent of BIM diffusion across markets. The model overlays BIM fields (technology, process, and policy) and BIM stages (modelling, collaboration, and integration). Countries that are seen to promote the diffusion of integrated practices as a policy are seen to be the most mature.

The results indicate that diffusion in Ireland is predominately focused on technology. This technology focus in Ireland currently extends to create more collaborative working and integrated practices. There was little reported diffusion when attempting to overlay BIM processes and policy to create more collaborative and integrated work practices (see Figure 6).

Figure 6: Model A: BIM Diffusion model

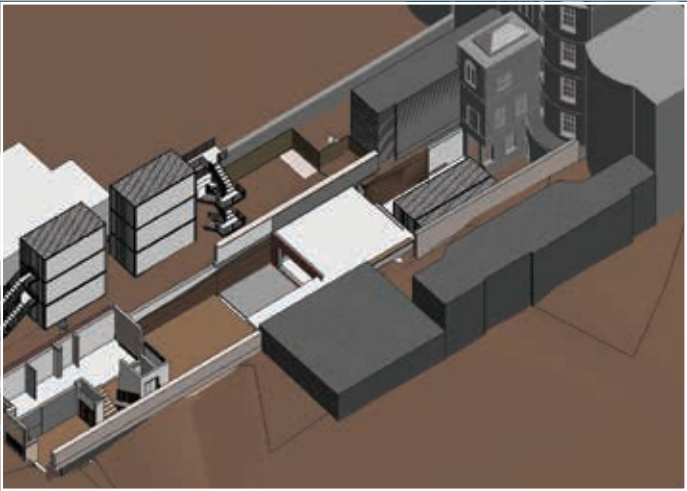


Study Participants

- Ralph Montague, Arcdox
- Joe Mady, Designer Group
- Calogero Marino, C+W O'Brien Architects
- Barry Kirwan, Ryan & Lamb Architects
- Barry McAuley, Construction IT Alliance
- Alan Hore, Dublin Institute of Technology
- Roger West, Trinity College Dublin
- Michael Murphy, BAM Ireland
- Adrian Small, BRFS Ltd
- Paul Sexton, SCEG Ltd
- Claire Crowley, Facebook
- Rob Moore, Grangegorman Development Agency
- Michael Earley, Scott Tallon Walker Architects
- Paul Brennan, BAM Ireland
- William Power, Reddy Architecture & Urbanism
- Antoinette Rourke, Dundalk Institute of Technology
- Aonghus O'Keeffe, Roughan & O'Donovan
- Ger Casey, Grangegorman Development Agency
- John Hunt, Enterprise Ireland

“Technology developers have encouraged diffusion but have not facilitated it as much as they may advertise.”

Aonghus O'Keeffe,
Roughan & O'Donovan.



Ireland's BIM Macro Adoption Study continued

“ Besides certain individuals, the Construction IT Alliance (CITA) has probably been the main advocate of BIM diffusion in Ireland, followed by some of the professional institutions (RIAI), and educational institutions (DIT, WIT, GMIT, etc). The policy makers of Ireland have been very slow to encourage BIM diffusion.”

Ralph Montague,
Ardox.

Model B - Macro Maturity Components Model

This model assesses the BIM maturity of countries using a comparative matrix or granularity using component-specific metrics. The model includes eight macro components: Objectives, Stages and Milestones; Champions and Drivers; Regulatory Framework; Noteworthy Publications; Learning and Education; Measurements and Benchmarks; Standardised Parts and Deliverables and Technology Infrastructure.

Results indicate that Ireland ranked highly when it came to technology infrastructure, which would be expected in a developed country. Learning and education; champions and drivers and noteworthy publications also ranked relatively highly, which is evident in the relevant section of this report. However, Ireland ranked poorly when it came to regulatory frameworks; standardised parts and deliverables; measurement and benchmarks (see Figure 6).

Model C - Macro Diffusion Dynamics Model

This model assesses and compares the directional pressures and mechanisms affecting how diffusion unfolds within a population. The model includes three diffusion dynamics: Top-Down; Middle-Out and Bottom-Up. In addition the model is augmented by three pressure mechanisms: downwards, upwards and horizontal.

Results suggest that Ireland's diffusion dynamic is middle out meaning that larger organisations or industry associations are pushing the BIM agenda within the industry and not government (see Figure 7).

Figure 6: Model B: Macro Maturity Components

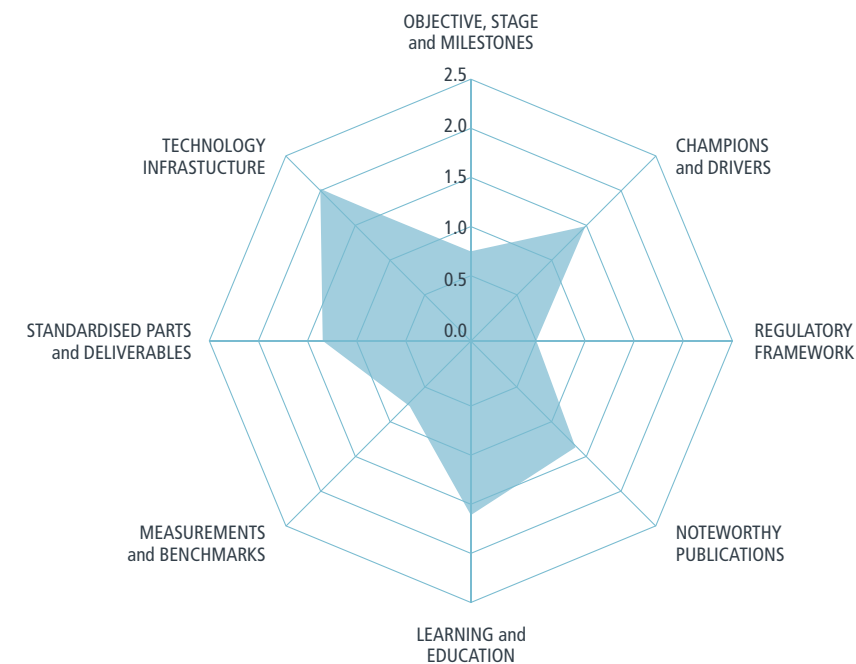
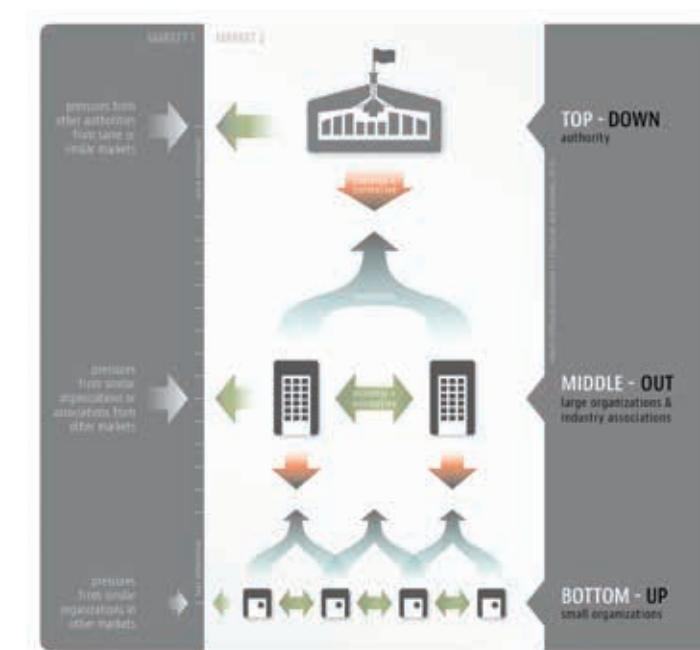


Figure 7: Model C: Macro Diffusion Dynamics Model



“ Large organisations are the main driving stakeholder group in Ireland currently. Government are concerned with specifying the use of BIM due to perceived competitiveness issues.”

Michael Murphy,
BAM Ireland.

Ireland's BIM Macro Adoption Study continued

“Some government organisations are leading the way, such as the NDFA for PPP projects and the HSE for larger healthcare projects. However, apart from these examples, we have seen little engagement from public bodies. To-date there is no government BIM mandate. There have been some recent developments as the GCCC have now published a BIM position paper.”

Brian Lahiff,
Garland Consultancy.

Model D - Policy Actions Model

This model identifies, assesses and compares the actions policy makers take to facilitate market-wide adoption. The model includes three policy approaches, namely: Passive; Active and Assertive. These approaches are in turn mapped against three policy activities: Make Aware; Encourage and Observe.

It can be seen that policy makers in Ireland are largely passive, with some evidence of active approaches and with little or no assertative activities (see Figure 8).

Model E - Macro Diffusion Responsibilities Model

This model assesses and compares the roles played by different stakeholder groups in facilitating diffusion within and across markets.

The model uses BIM fields to identify nine player groups, namely: policy makers; educational institutions; construction organisations; individual practitioners; technology developers; technology service providers; industry associations; communities of practice; and technology advocates. It is evident from the results that all stakeholder, with the exception of policy makers have helped to create BIM diffusion in Ireland (See Figure 9).

Figure 8: Model D: Policy Actions Model

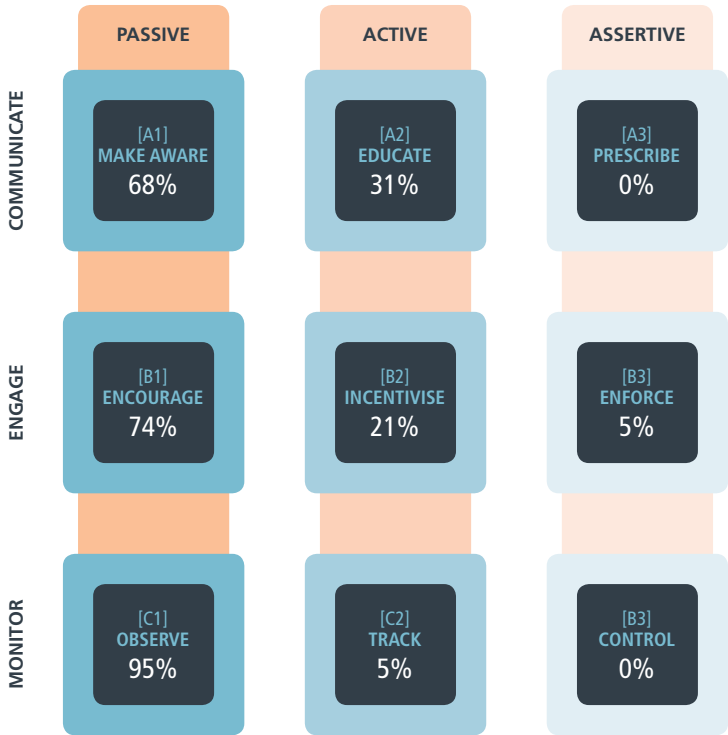
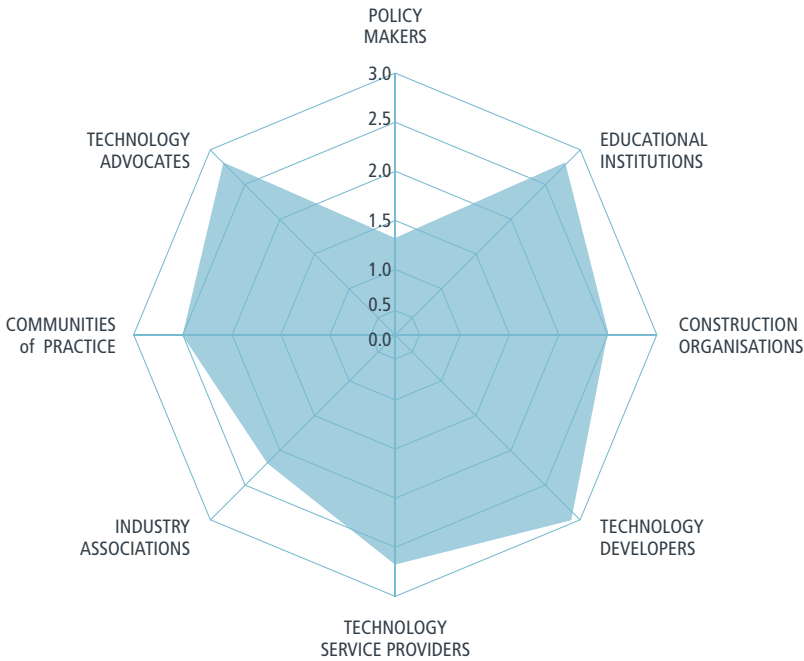


Figure 9: Model E Macro Diffusion Responsibilities Model



“The larger construction contractor firms have adopted BIM to drive efficiency in business and ensure that they remain market leaders through innovation. The top down diffusion is predominately absent however we are seeing an improvement in this such as: Major health capital projects, Grangegorman Development Agency and DCC projects which are now driving the use of BIM. The supply chain tier are gearing up to support the large contracting firms with many firms already demonstrating significant BIM capabilities - particularly in the M&E sector.”

Claire Crowley,
SCSI.



Overall Findings



Overall Findings

While our construction industry is on an upward trajectory the sector is experiencing a number of challenges, which include an acute shortage of housing, lack of trade skills and a shortage of graduates and qualified professionals.

The recent decision by the UK to leave the EU is significant for our industry, a decision that will have a long lasting impact on our sector. Our neighbour's ambitious BIM programme in recent years was perhaps the single biggest factor that has influenced our BIM capability to-date. Many Irish AEC businesses continue to work routinely on Level 2 BIM projects throughout the UK and on a daily basis with readily available BIM frameworks and guidelines.

CITA's recently published global BIM study highlighted the increasing relevance of BIM to the international construction community. Ireland needs to join the rest of the developed world in developing its own national BIM programme but also needs to share and learn from other countries that are more advanced in their BIM journey.

The authors placed an emphasis on the important work of the EU BIM Task Group, the UK Level 3 BIM programme and the recent Scottish BIM policy announcement. These are important proximate initiatives that we need to closely monitor and engage with on an ongoing basis.

Digitisation and innovative practices, such as, BIM and Lean Construction have the potential to fundamentally enhance the industry's competitiveness and this is why our government, educators and industry have responded in such a positive manner to-date. While this report documented an array of BIM initiatives, activities by BIM champions and acknowledged the importance of the leadership shown by Enterprise Ireland in funding BIM programmes in Ireland, leaders in industry and government need to bring an order to BIM deployment in the Construction Sector.

An important first step in this national BIM programme included the recent GCCC position paper on *A Public Sector BIM Adoption Strategy*. It is hoped that this statement of intent coupled with the imminent *National BIM Council Roadmap to Digital Transition for Ireland's Construction Sector* will go a long way to providing an orderly transition to a digital future. The authors firmly believe that the only way this can be achieved is by both the government and industry working together for the benefit of all. The promotion of BIM and support of industry in adopting BIM technologies, tools and processes will greatly assist in attracting younger people to enter our industry.

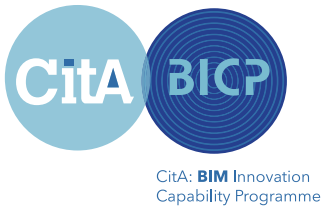
Ireland has made significant progress with BIM in a relatively short number of years. It is evident from *Ireland's BIM Macro Adoption Study 2017* that there is a need for a regulatory framework, strategic milestones and benchmarks to be put in place to ensure that we can more confidently monitor the impact of a successful digital construction programme going forward.

“ Whilst the headline statistics for the industry are positive – we predict we will grow from €15bn to €20bn output by 2020 – my role as President is to draw attention to the fact that regional construction companies are still suffering. They have to ‘travel up the road’ to Dublin to secure work or worse they are facing closure. I believe that there are parts of the country and the industry that will not see recovery if we don’t take imaginative and bold steps to support communities.”

Dominic Doheny,
CIF President 2017.



The future is BIM,
the future is here.



Capturing the Construction Industry
and Academia's response to the
increased requirement for **BIM** on
Irish Construction projects



Construction IT Alliance: 23 Fitzwilliam Square, Dublin 2, Ireland. www.cita.ie